

CLAIMS

What is claimed is:

- 5 1. A method for configuring a microcontroller, comprising:
- displaying a collection of virtual blocks in a design system with each
- virtual block in said collection corresponding to a programmable block in said
- microcontroller;
- selecting a user module defining a function;
- 10 assigning a virtual block taken from said collection to said user module;
- and
- automatically constructing a source code table file comprising
- configuration information for a programmable block of said microcontroller
- corresponding to said virtual block wherein said configuration information is
- 15 used to cause said programmable block to implement said function.
2. The method of Claim 1, wherein said function comprises a pulse
- width modulator.
- 20 3. The method of Claim 1, wherein said function comprises a timer.
4. The method of Claim 1, wherein said function comprises an
- analog-to-digital converter.

5. The method of Claim 1, wherein said function comprises a digital-to-analog converter.

6. The method of Claim 1, wherein said function comprises a
5 counter.

7. The method of Claim 1, wherein said function comprises a signal amplifier.

10 8. The method of Claim 1, wherein said function provides serial communication.

9. The method of Claim 1, wherein said collection is displayed as a two dimensional array of programmable analog virtual blocks and
15 programmable digital virtual blocks.

10. The method of Claim 1, wherein said assigning further comprises assigning a second virtual block to said user module.

20 11. The method of Claim 1, wherein said code table file is an assembly code table file and further comprises:

a symbolic name for a register address in said programmable block.

12. The method of Claim 11 wherein said symbolic name is derived from said function.

13. A method of configuring a microcontroller having a programmable
5 block, said method comprising:
selecting a user module defining a circuit design;
assigning a virtual block in a design system where said virtual block
corresponds to said programmable block; and
automatically constructing an assembly code file holding configuration
10 information for said programmable block to implement said circuit design.

14. The method of Claim 13, wherein said automatically constructing
further comprises:
computing a register address for a register within said programmable
15 block;
determining a symbolic name for said register address; and
placing said symbolic name into said assembly code file.

15. The method of Claim 14, wherein said placing further comprises:
20 substituting said symbolic name for a generic name in a template file.

16. The method of Claim 13, wherein said automatically constructing
further comprises:
determining a symbolic name;

computing a register address for a register within said programmable block;

assigning said symbolic name to said register address; and
placing said symbolic name into said assembly code file.

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17. A method of configuring a microcontroller having a programmable block, said method comprising:

selecting a user module defining a function;

assigning a virtual block in a design system where said virtual block

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corresponds to said programmable block; and

automatically constructing an assembly code file with personalization information specifying said programmable block as performing said function.

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18. The method of Claim 17, wherein said automatically constructing further comprises:

computing a register address for a register within said programmable block;

determining a symbolic name for said register address; and

placing said symbolic name into said assembly code file.

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19. The method of Claim 18, wherein said placing further comprises:
substituting said symbolic name for a generic name in a template file.

20. The method of Claim 17, wherein said constructing further comprises:

- determining a symbolic name;
- computing a register address for a register within said programmable
- 5 block;
- assigning said symbolic name to said register address; and
- placing said symbolic name into said assembly code file.

21. A method of configuring a microcontroller having a programmable

10 block, said method comprising:

- selecting a user module defining a function having a control parameter;
- assigning a virtual block in a design system where said virtual block
- corresponds to said programmable block; and
- constructing an assembly code file operating said control parameter
- 15 within said programmable block.

22. The method of Claim 21, wherein said constructing further comprises:

- computing a register address for a register within said programmable
- 20 block;
- determining a symbolic name for said register address; and
- placing said symbolic name into said assembly code file.

23. The method of Claim 22, wherein said placing further comprises:

substituting said symbolic name for a generic name in a template file.

24. The method of Claim 21, wherein said constructing further comprises:

- 5 determining a symbolic name;
 computing a register address for a register within said programmable
block;
 assigning said symbolic name to said register address; and
 placing said symbolic name into said assembly code file.

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25. A method of configuring a microcontroller having a programmable block, said method comprising:

- selecting a user module defining a function having a control parameter;
 assigning a virtual block in a design system where said virtual block
15 corresponds to said programmable block;
 constructing an assembly code routine using said control parameter; and
 constructing a header file referencing said assembly code routine.

26. A computer system comprising a processor coupled to a bus and
20 a memory coupled to said bus, said memory containing instructions to
implement a method for configuring a microcontroller, said method comprising:
 displaying a collection of virtual blocks in a design system with each
virtual block in said collection corresponding to a programmable block in said
microcontroller;

selecting a user module defining a function;
assigning a virtual block taken from said collection to said user module;
and
automatically constructing an assembly code table file holding
5 configuration information for a programmable block corresponding to said
virtual block to perform said function.

27. The computer system of Claim 26, wherein said collection is
displayed as a two dimensional array.

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28. The computer system of Claim 26, wherein said assigning further
comprises assigning a second virtual block to said user module.

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29. The computer system of Claim 26, wherein said assembly code
table file further comprises:
a symbolic name for a register address in said programmable block.

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30. The computer system of Claim 26 wherein said symbolic name is
derived from said function.

31. A computer implemented method of generating program
information for a programmable electronic device comprising:

a) selecting a user module, wherein said user module is defined by a
first data structure;

b) placing said user module within a hardware resource of said programmable electronic device, wherein said hardware resource is defined by a second data structure;

c) using said first and second data structures to automatically generate first source code for realizing said user module within said hardware resource; and

d) saving said first source code in a computer file.

32. A method as described in Claim 31 further comprising:

e) selecting parameter values that define the behavior of said user module such that it operates in a prescribed manner;

f) automatically generating second source code, based on said parameter values, for causing said user module of said hardware resource to behave in said prescribed manner; and

g) saving said second source code in a computer file.

33. A method as described in Claim 32 further comprising using said first and second source code to program said programmable electronic device.

34. A method as described in Claim 33 wherein said programmable electronic device is a microcontroller.

35. A method as described in Claim 31 wherein said a) and said e) are performed using a graphical user interface.